

Blue

Work Order ID 55780



Page 1

February 1, 2010 10:11:13 AM

Item ID: D206-667-103BL

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Fwd, Blue

Stop



Start Date: 2/02/10 Start Qty: 1.00



Cust Item ID:

Required Date: 2/12/10 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

PL

Date: 1002-1

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr	Revision Nbr
----------	--------------

D206-667-143	C
--------------	---

100



DOCUMENT CONTROL

DC

Document Control

Memo

0.00

Photocopy bluefile and create labels as per PPP D206-667-103 CHG004

5/2/25

JG 5/2/25 LL 10/02/25

110



Pick Kit

0.00

Packaging

Packaging

Memo

0.00

Packaging

CK

S

MB 10-02-03

120



BENDING MACHINE - CROSSTUBES

0.00

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D206-667-143 using CNC bender program

CK

S

MB 10-02-03

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center ID

130



QC

Quality Control

Operation
Description

QC15- Crosstube Dimensional Check



Memo

Set Up/
Run Hours

0.00

S10/2/04

Draw
Number

0.00

Draw
Rev.

0.00

Plan
Code

0.00

Accept
Qty

0.00

Reject
Qty

0.00

Reject
Number

0.00

Insp.
Stamp

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Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

140



Crosstubes

0.00

Crosstubes

Memo

0.00

See Part sheet for Drill holes.
5/10/10

Crosstubes

1-Drill holes & ream using drill Jig DT8541 & DT8542 as per Dwg D206-667-143. Drill all (3) top holes.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8541 & DT8542 as per Dwg D206-667-143. Drill only the top (2) holes.

5-Drill pilot holes as per Dwg D206-667-143. Drill only the top (2) holes.

6-Drill Fwd rivet holes using drill Jig DT8787FWD as per Dwg D206-667-143. Note: Fwd side has 3x top holes.

7-Drill Aft rivet holes using drill Jig DT8787AFT as per Dwg D206-667-141.

8-C'sink holes as per Dwg D206-667-143. Allow rivet to sit below surface to compensate for paint.

9 -Scribe part # and batch # using vibrating stylus as per Dwg D206-667-143
Inside of Cuff(Donot engrave on outside of tube)

10-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-143

MB 204
D

-Hwly

10-2-4

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Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150



Crosstubes Chemical Conversion

0.00

1 - - Avn10-29

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

160



QC3- Inspect Part Finish

0.00

S.02/09

QC

Memo

0.00

Quality Control



170



QC5- Inspect part completeness to step on W/O

0.00

S.02/09

QC

Memo

0.00

Quality Control



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Date:

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Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

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NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180



Outsource process - NDT per QSI038 4.1

0.00

PO 11364 BL
10-2-16 ①

Outsource2

Memo

0.00

Outsource process - NDT

CROSSTUBES

190



Packaging

0.00

10/3/17 ①

Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

200



QC5- Inspect part completeness to step on W/O

0.00

10 02 17 ①

QC

Memo

0.00

Quality Control

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Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210



SprayPaint

0.00

10

02

17 01

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube grey as per QSI 005 4.2

2-Paint outside crosstube *Primer: 110918*Paint Delfleet Blue B *113171*Clear Delfleet B *110896*

per QSI 005 4.2

PRIME:

Start Time: *10:00*Finish Time: *11:00*

PAINT:

Start Time: *3:00*Finish Time: *4:00*

220



QC14- Inspect Spray Paint

0.00

BT 60-02-18

QC

Memo

0.00

Quality Control

Wrap in plastic bag to protect from scratches

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Reference:

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Date: _____

Run Start



QC: _____

Date: _____ SPC (Y/N): _____

Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberReject
NumberInsp.
Stamp

230



Crosstubes

0.00


 10 02 11 (1)

Crosstubes

Memo

0.00

1-Install support using 0.03" to 0.06" thick layer of magnobond 6398 per QSI 015. Let cure for 12h after installation and prior to packaging. Note: (2) Aft holes should be facing up.

A/R Magnobond 6398: 110417 exp: 01/2011

2-Install supports and clamps as per Dwg D206-667-143. Torque clamps to 80-100 in lb

3-Install nut plates as per Dwg D206-667-143. Touch-up rivet heads with Imron paint.

240



QC5- Inspect part completeness to step on W/O

0.00


 8/04/23

0.00


 XC

QC

Memo

Quality Control

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Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

250



Packaging

Pick Kit

0.00

10-2-25 SF

Packaging

Memo

0.00

260



QC

Quality Control

QC4- 100% Inspect kits for completeness

0.00

SF 02/25

FD

Memo

0.00

270



Packaging

Packaging

0.00

10-2-26 SF

Packaging

Memo

0.00

Identify and pack for shipping as per PPP D206-667-103
Location: _____
PPP Rev: b

W/O:		WORK ORDER CHANGES					
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Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

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Work Center IDOperation
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Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

280



QC21- Final Inspection - Work Order Release

0.00

10/03/03 JJ

QC

Quality Control

Memo

0.00

B/ 10-2-24
①

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

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Work Order ID: 55780



Parent Item: D206-667-103BL



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Start Date: 2/02/10

Required Date: 2/12/10

Comments: IIP RevA: new issue DD .09.11.23 verified by:EC

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D206-667-103TRN		Manufactured	No			110	Each	2.0000	1.0000		MR	10-02-03 ✓

Crosstube Turning Detail

Warehouse	Loc Qty	Loc Code		
			Location	
Main Warehouse				
FG	2			
52829	1			
52830	1			
D2873-043	230	47.0000 2.0000	Each	

Nut Plate Assembly

Warehouse	Loc Qty	Loc Code		
			Location	
Main Warehouse				
ST	47			
45370	2			
45422	1			
50002	4			
50871	20			
53966	20			

10/02/23

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Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D2873-045		Manufactured	No			230	Each	65.0000	2.0000			

Nut Plate Assembly

Warehouse

Location

Main Warehouse

ST	65
45210	3
<u>50001</u>	22
53967	20
53968	20

D2891-1

Manufactured No

230 Each 67.0000 2.0000



2.25 Support

Blue

Warehouse

Location

Main Warehouse

ST	67
40336	1
43880	18
46159	20
50952	20
<u>53347</u>	8

MM 10 02 23

MM 10 02 22

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Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D3595-063-395		Manufactured	No			230	Each	28.0000	4.0000			

RUBBER CUSHION

Warehouse

Location

Main Warehouse

ST

Loc Qty

Loc Code

ML 10 02 22

44667

28

28

cut (4)0.063" X 3.95"

MS20601-AD4W8

Purchased

Barcode for MS20601-AD4W8

No

230

Each

372.0000 14.0000



RIVET

Warehouse

Location

Main Warehouse

ST

Loc Qty

Loc Code

ML 10 02 23

108521

372

112203

200

112203

172

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MS21920-20		Purchased	No		230		Each	115.3000	4.0000			

Clamp (per MIL-DTL-8783C)

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST	115.3	
103478	2	
106484	12	
109269	9.3	
110536	10	
<u>112307</u>	32	
112624	39	
112793	11	

AN5-30A



Purchased No

250 Each 71.0000 4.0000



W 10/02/22

BOLT

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST	71	
<u>110467</u>	21	
112933	50	

10-2-25 SF

4

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---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	--------------------------	---------------	----------------	--------

AN5-32A

Purchased

No

250

Each

172.0000 4.0000



10-2-25 SP

Bolt

Warehouse

Location

Main Warehouse

ST	172	
106242	3	
106519	4	
110363	17	
<u>112933</u>	48	
113121	100	

AN5-7A

Purchased

No

250

Each

174.0000 10.0000



10-2-25 SP

Bolt

Warehouse

Location

Main Warehouse

ST	157	
110625	7	
113149	100	
<u>113226</u>	50	

Main Warehouse

t	17	
112829	17	

AN960JD516

Purchased

No

250

Each

0.0000 18.0000



1113524 10-2-25 SP

Washer

February 1, 2010 10:11:18 AM

Shop Packet Print

Page 5

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Start Date: 2/02/10

Required Date: 2/12/10

Comments: IIP RevA: new issue DD .09.11.23 verified by:EC

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
AN970-4		Purchased		No		250	Each	262.0000	12.0000		10-2-25	SL

Washer

MS21042LS



Nut

Warehouse

Location

Main Warehouse

ST	262	
104885	3	
107242	3	
107715	1	
108077	2	
108377	19	
111724	3	
112082	1	
112794	9	
112991	221	

Purchased

No

250

Each

533.0000 4.0000



10-2-25

SL

Warehouse

Location

Main Warehouse

ST	533	
110382	10	
111636	1	
112314	22	
113523	300	
113537	200	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD

Work Order:

55780

Description: Crosstube High Fwd (206L)

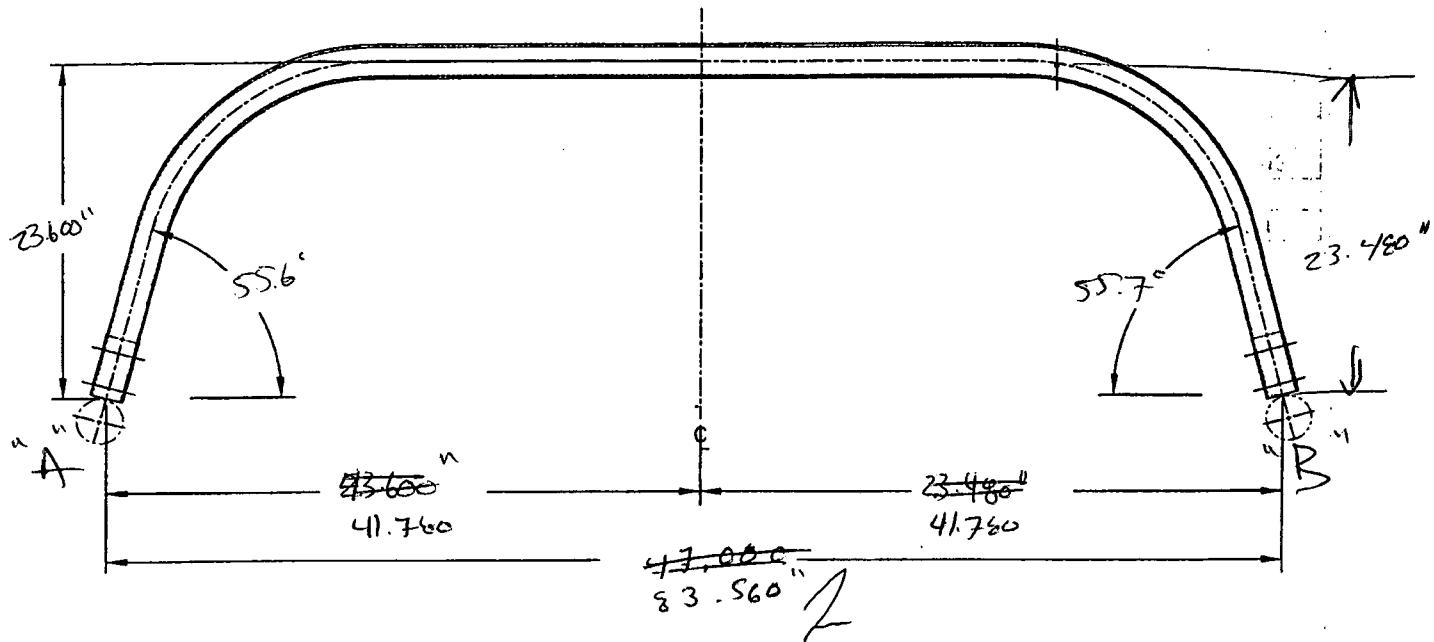
Part Number:

D206-667-103

Inspection Dwg: D206-667-143 Rev: C

Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	41.79	42.05
Angle	54	56
Total Span	83.58	84.10



Comments

→ Adjuster holes to match height of
xtube

QC15 Inspection

S

Date

10/02/04

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.26	Dimensions updated per Dwg Rev C	KJ	
C	09.10.22	Minimum height dimension revised	KJ	J

Item	Qty	Part Number	Description
1	X	D206-667-143	CROSSTUBE ASSEMBLY (206L HIGH FWD)
2	1	D6002-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3595-063-395	RUBBER CUSHION
7	4	MS21920-20	CLAMP (OR MS21920-21)
8	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

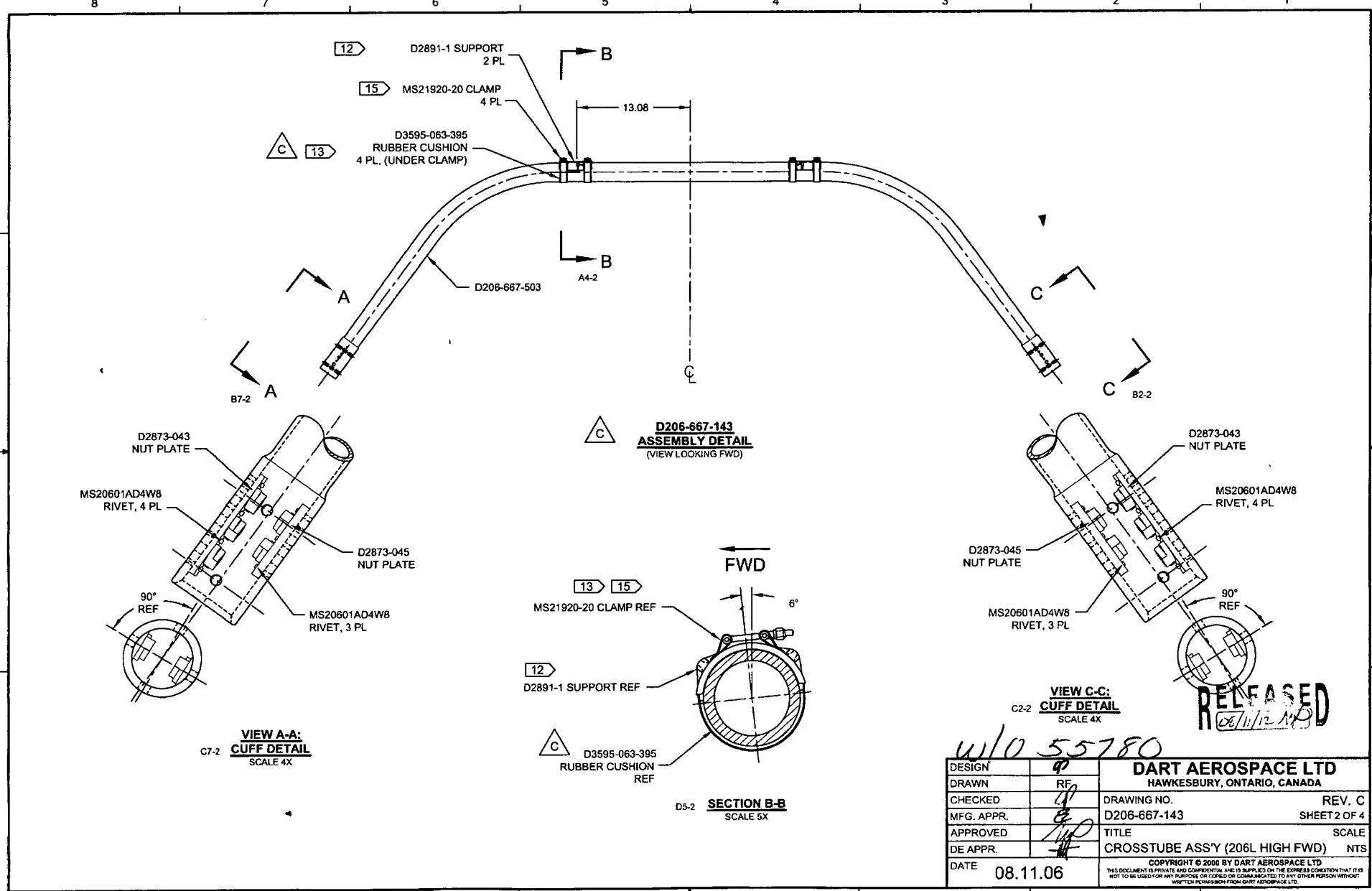
GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6002-115
FINISHED LENGTH = 104.98±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-143" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 15.5 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2891-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-20 CLAMPS (OR -21) WITH D3595-063-395 RUBBER CUSHIONS TO SECURE THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP
 RETURN
 ENGINEER
 UNCONTR
 SUBJECT TO
 WITHDRAW
 WORK ORD
 NO. 55780
 10-02-1

RELEASED
08/11/11

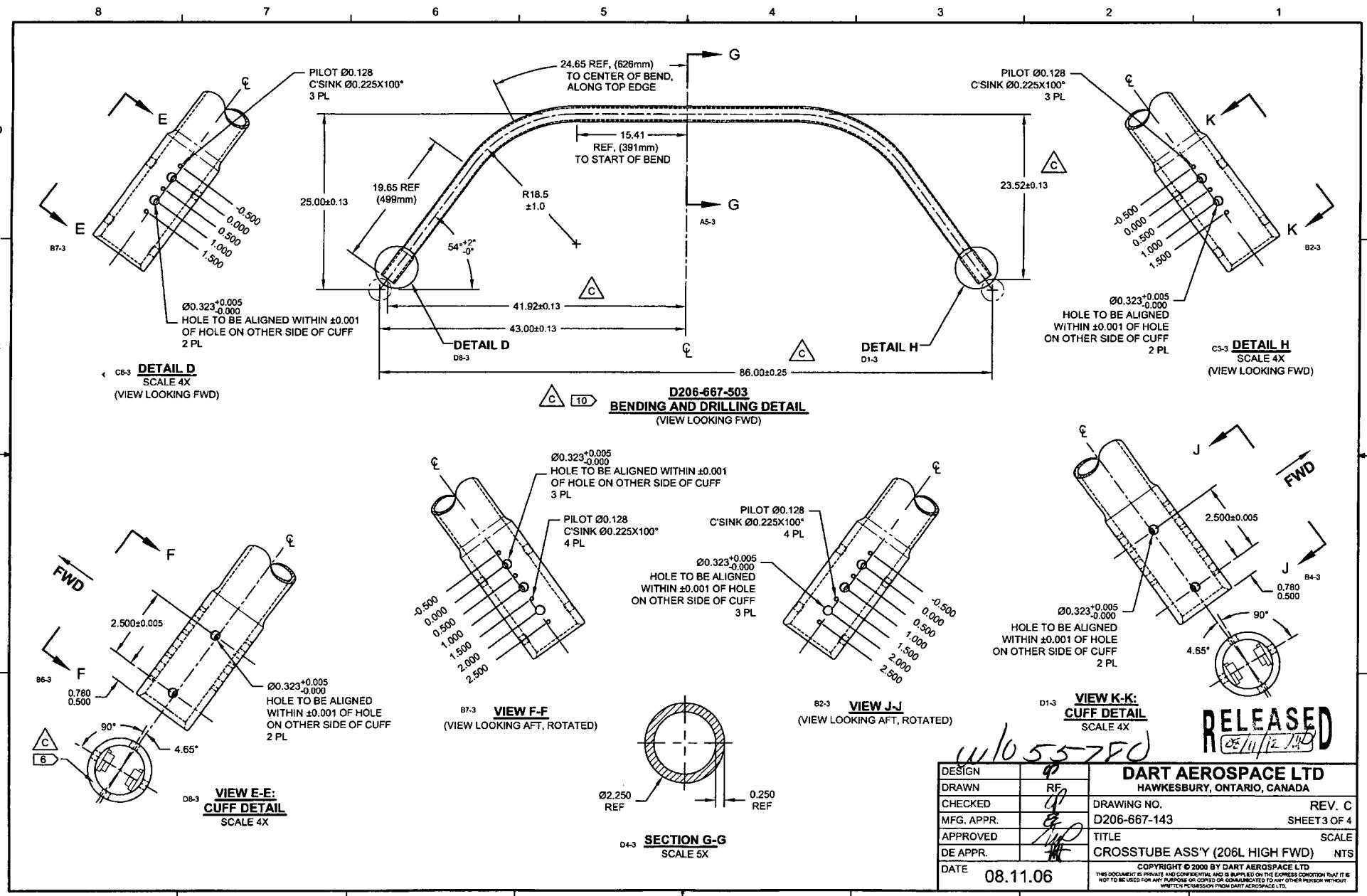
C	REVISE GENERAL NOTES/PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3595-063-395 WAS D2855-400-694 (ZN D6-2 & A5-2); REMOVED REF. & ADD TOLERANCE (ZN D3-3, C4-3, C5-3); RELOCATED FLAG #6 (ZN A8-3) PER NCR 210; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	08.11.06
B	ADD HOLES AND NUT PLATES FOR COMPATABILITY WITH BHT/AA SKUTUBES	PH	05.07.26
A	NEW ISSUE	CP	00.11.17
REV.	DESCRIPTION	BY	DATE
DESIGN	9	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. C
MFG. APPR.	E	D206-667-143	SHEET 1 OF 4
APPROVED	9	TITLE	SCALE
DE APPR.		CROSSTUBE ASSY (206L HIGH FWD)	NTS
DATE	08.11.06	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY OTHER PURPOSE OR SHOWN TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	



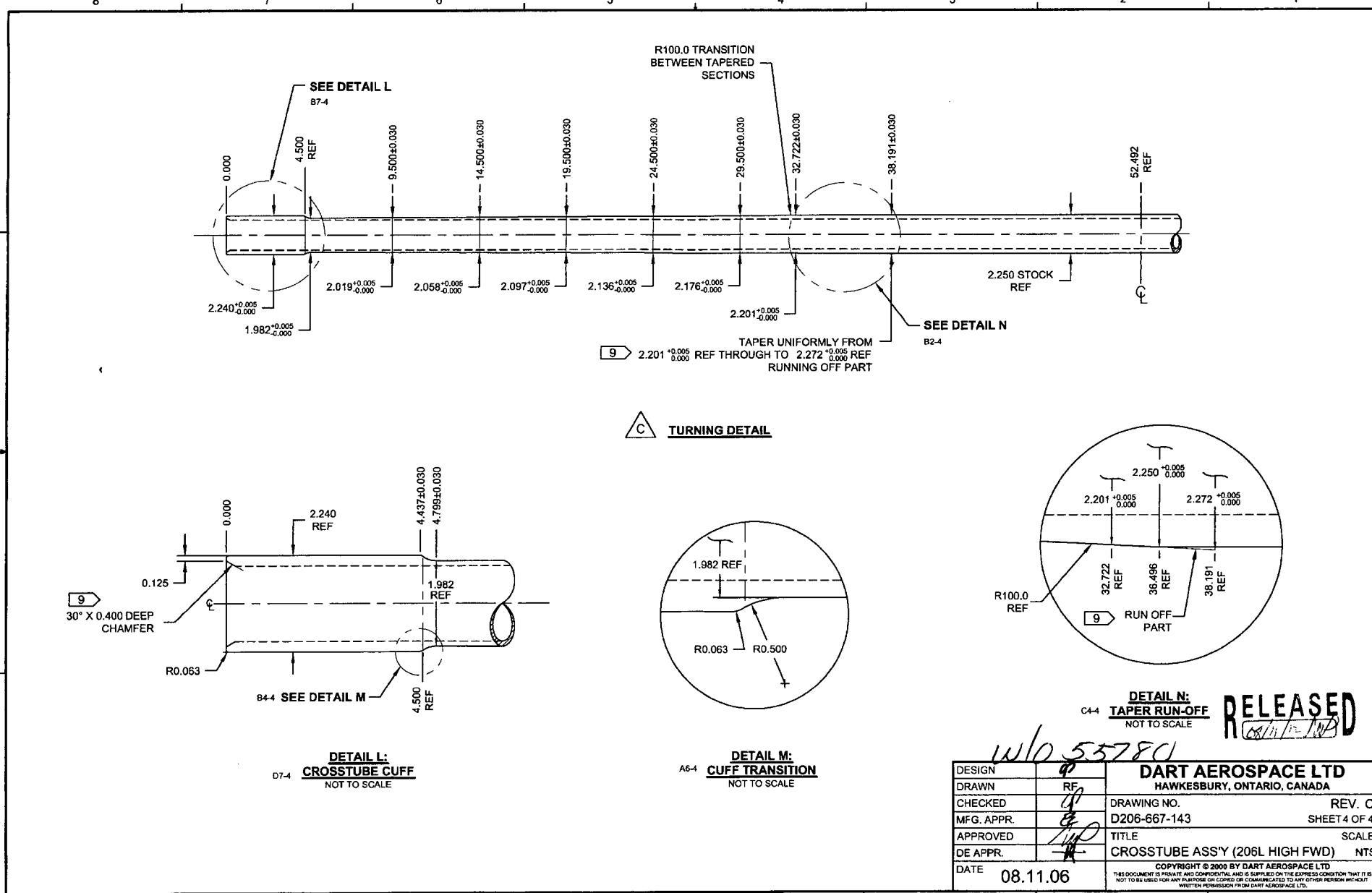
DESIGN	9	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	10	REV. C
MFG. APPR.	E	DRAWING NO. D206-667-143 SHEET 2 OF 4
APPROVED	14	TITLE
DE APPR.	14	SCALE
DATE	08.11.06	CROSSTUBE ASS'Y (206L HIGH FWD) NTS

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W/0 55780



DESIGN		DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	10	DRAWING NO.	REV. C
MFG. APPR.	8	D206-667-143	SHEET 3 OF 4
APPROVED	MM	TITLE	SCALE
DE APPR.	MM	CROSSTUBE ASS'Y (206L HIGH FWD) NTS	
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LIQUID PENETRANT TEST REPORT

P- 15318

IN

DAT 4 ELL. S. ACE
LINDA F. STENFEL
1272 ABERDEEN ST.
HARROWSBURY, N. K6A 1K7
F.P.I. on GLASS TUBES
E Pcs

DATE FEB 11-2010 TIME AM PM
ACUREN JOB NO. 199-10-0651
PO/WO NO. 11364
WORK LOCATION S400
ACCEPTANCE STD. ASTM 1417 REV./DATE 2007

EXAMINED

DESCRIPTION PROCEDURE NO. LT-~~1002~~ REV./DATE TECHNIQUE NO. LT-~~1002~~ REV./DATE
MATERIAL LIQUID ACUREN THICKNESS
WET FLUORESCENT LIQUID PENETRANT INSPECTION
CARRIED OUT 100% EXTERNAL

DETAILS

<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
BRAND LIQUID FLUX		BLACK LIGHT S/N 16839	<input checked="" type="checkbox"/> OUTPUT > 1000 μ W/cm ²	<input type="checkbox"/> AMBIENT < 2 fc
INT 2607	MINIMUM DWELL TIME 4.5 30 MIN.	LIGHTING EQUIP.	<input type="checkbox"/> FLASHLIGHT	<input type="checkbox"/> TROUBLELIGHT
INT REMOVER 1720	MINIMUM DRY TIME >10 MIN.	OTHER LABING	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE	
PER S400	MINIMUM DWELL TIME 10 MIN.	LIGHT METER S/N 1098866		CAL DUE DATE
PER TYPE <input checked="" type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY				MAY 7-2010

URFACE

CONDITION <input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input type="checkbox"/> CLEAN BARE METAL
TEMPERATURE <input type="checkbox"/> < -4°C/20°F	<input type="checkbox"/> -4°C/20°F to 10°C/50°F		<input checked="" type="checkbox"/> 10°C/50°F to 52°C/125°F	<input type="checkbox"/> > 52°C/125°F

TS- (METRIC IMPERIAL)

GLASS TUBE W.C. 55758 ✓
GLASS TUBE W.C. 55760 ✓
GLASS TUBE W.C. 55779 ✓
GLASS TUBE W.C. 55780 ✓

ALL ITEMS EXAMINED ON
THIS REPORT HAVE BEEN
ACCEPTED TO STANDARD.

GLASS TUBE W.C. 55791 ✓
GLASS TUBE W.C. 55782 ✓
GLASS TUBE W.C. 55134 ✓
GLASS TUBE W.C. 55135 ✓

10 02 17

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TURES

REPRESENTATIVE <u>Jeff Tilton</u> PRINT <u>Jeff Tilton</u>	<u>Jeff Tilton</u> SIGNATURE	DTR # E 27362
TECHNICIAN (SIGNATURE): <u>Mike F. Stenfelin</u>		REPORT REVIEWED BY:
(PRINT): <u>Mike F. Stenfelin</u>		NAME <u></u> INITIALS <u></u>
1 ST TECHNICIAN CGSB LEVEL <u>E</u> SNT LEVEL <u>E</u>	2 ND TECHNICIAN CGSB LEVEL <u>E</u> SNT LEVEL <u>E</u>	
CGSB REG. NO. <u>6606</u>	CGSB REG. NO. <u></u>	